DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Agency for Toxic Substances
and Disease Registry

Memorandum

Date November 7, 1990

From Environmental Health Scientist, Emergency Response and Consultation Branch (ERCB), Division of Health Assessment and Consultation (DHAC), ATSDR, (E32)

Subject Health Consultation: Snow Hill Lane Site
Brooklyn, Anne Arundel County, Maryland

To Charles J. Walters
Public Health Advisor
ATSDR Regional Services
EPA Region III
Through: Director, DHAC, ATSDR (E32)
Chief, ERCB, DHAC, ATSDR (E32)

BACKGROUND AND STATEMENT OF ISSUES

The Agency for Toxic Substances and Disease Registry (ATSDR) received a request from the Environmental Protection Agency (EPA), Region III to review the data associated with the Snow Hill Lane Site (SHL), Brooklyn, Anne Arundel County, Maryland. The EPA requested ATSDR to determine if the site represents a human health threat.

The Snow Hill Lane Site consists of approximately 86 acres of flatlands. Most of the site is a wooded area with heavy brush. The site is used for recreational activities as evidenced by several trails, probably made by bicycle, motorcycle, or pedestrian traffic. The site is bounded on the west by Mount Calvary Cemetery and Snow Hill Lane, on the north by Cedar Hill Lane and the Pennington Avenue Landfill, on the east by the Pennington Avenue Landfill and the Baltimore and Ohio Railroad, and on the south by the Cabin Branch Creek. This stream varies in width, from 8 inches to 4 feet, and in depth, from several inches to 1 or 2 feet along the border of the site. Within 1 mile of the site, Cabin Branch Creek widens and empties into Curtis Creek and then eventually into the Patapsco River. The section of the Cabin Branch Creek adjacent to the site is probably not fished.

The site is completely unfenced and is adjacent to Interstate Highway 695 which lies to the south of the site. Approximately ten residences are located within 200 yards of the site near the northwest boundary and are topographically upgradient. File data indicate that two of the residences use private wells for potable and domestic water supplies, while the remainder of the residences use municipal water. The depth to groundwater varies from 10 to 30 feet. Reportedly, the groundwater flows east, toward the Patapsco River. Surface runoff from the site flows south into Cabin Branch Creek, a stream that flows along the southern boundary of the site.

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The Snow Hill Lane Site was reportedly operated as an unpermitted dump during the 1950s and 1960s. It was discovered by a Maryland Waste Management Administration (MWMA) inspector in February 1982. Private citizens and the State of Maryland have expressed concern about the potential for adverse environmental impacts and health implications. Past site investigations (1982-1989) revealed the presence of polychlorinated biphenyls (PCBs), lead, and cyanide at levels in soil that were above the expected backgrounds for the area. Also scattered across the site are abandoned drums and tires. The drums are in various stages of disintegration and have apparently been used for target practice. There is some indication that there are buried drums on-site. These drums may still contain toxic materials. Some of the tires are still inflated.

On July 18, 1990, additional sampling and observations were performed at the site. Approximately 300 drums were observed, most (276) were 55-gallon steel drums. The remainder were 35-gallon fiberglass drums. As noted above, many of the drums were used for target practice. In many instances, the contents of the drums had seeped onto the ground. Some of the tires and the more intact drums appeared to contain standing water.

Areas of stressed vegetation were observed around several of the drum piles. An unvegetated area of about 100 square feet on-site might indicate the presence of buried drums or the presence of contaminants in the soil that prohibit the growth of vegetation. Composite samples from the contents of drums, soil, and the areas of drum seepage were obtained for analysis. Sample analyses indicated the presence of various contaminants.

The soils with the highest contamination were found to be associated with drum clusters located in the north central portion of the site. Total cyanide levels ranging from 2 parts per million (ppm) to 68 ppm were detected. Aroclor 1254, a PCB, was detected at levels ranging from 0.08 ppm to 250 ppm. Lead levels ranged from 70 ppm to 15,700 ppm. Mercury levels ranged from 0.12 ppm to 200 ppm.

A sample of soil obtained off-site at or near an industrial area was used to provide an indication of background levels. A lead concentration was reported as 730 ppm, a level which is probably above the natural soil level for the area.

Water samples were obtained from locations upstream and downstream in the Cabin Branch Creek and from one off-site, presumably upgradient, private residential well. At each of the sampled locations, 0.2 ppm of lead was detected. It is not clear if these samples were filtered or unfiltered or

why all of the samples had the same reported levels. Sediment samples were collected at the same locations as the upstream and downstream water sample locations. None of the metal levels detected in sediments was of public health concern.

DOCUMENTS AND INFORMATION REVIEWED

1. Memorandum from Walter F. Lee, OSC, Eastern Response Section, EPA, Region III, to Mr. Charles J. Walters, Public Health Advisor, ATSDR Region III, about Snow Hill Lane Site, Brooklyn, Anne Arundel County, Maryland, dated October 2, 1990.

2. Chronology of Events, Snow Hill Lane Site.

3. Site Location Map.

4. Tables I-IX, Sampling Results for MWMA, NUS, TAT.

5. Sampling Location Map for MWMA, NUS, TAT.

6. TAT July 1990 Trip Report.

7. CLP Basic Data Interpretation.

8. ATSDR, Toxicological Profile for Mercury, ATSDR/TP-89/16, December 1989.

9. ATSDR, Toxicological Profile for Cyanide, ATSDR/TP-88/12, December 1989.

10. ATSDR, Toxicological Profile for Lead, ATSDR/TP-88/17, June 1990.

DISCUSSION

Potential exposures to lead appear to be the most serious threat to health identified at the site. Feasible exposures to lead at the site include ingestion of contaminated groundwater and ingestion and inhalation of contaminated soils during recreational activities on-site. Maximum lead levels (15,700 ppm) in soil were found near clusters of drums. Although other toxic substances including cyanide, mercury, and PCBs were detected at elevated levels in soils, the levels at this site, with the exception of cyanide, do not appear to pose as serious a concern as that of lead. The maximum level of cyanide detected at the site was 68 ppm. Ingestion of several grams of this cyanide-containing soil within a short period of time (5-30 minutes) could represent an acute health concern, most notably amongst children with pica.

It has been suggested that repeated exposures via ingestion or inhalation to soils containing greater than 500 ppm of lead could lead to elevated blood lead levels and adverse health effects. Detected levels of lead at areas of this site are as high as 15,700 ppm. Preschool age children would be most vulnerable to the toxic effects of lead and are the most likely to ingest lead-contaminated soil through play or pica behavior. Toxic effects of lead include adverse effects on the central nervous system, behavioral changes, encephalopathy, kidney damage, and anemia. Evidence of frequent pedestrian traffic, and the close proximity of area residences, suggest that frequent contact with contaminated on-site soils can occur.

There is also the possibility that lead contamination exists off-site. A lead background level of 730 ppm was cited in the data package. While such levels could indicate lead enrichment as a result of vehicular traffic, the possibility exists that off-site migration of lead has occurred. The information provided was not sufficient to evaluate this possibility.

A lead level of 0.2 ppm was reportedly detected in water obtained from one residential well. This level is above EPA's Proposed Maximum Contaminant Level of 0.005 ppm for potable water. Assuming the level of lead detected in the well water is an accurate representation of the water quality, consumption of the water poses a health concern to young children and adults alike. Developing fetuses may be at special risk. Use of the water for bathing or other non-potable purposes probably presents little or no health hazard. However, the fact that the water samples obtained during the last sampling round reportedly contained the same concentration of lead, regardless of location and type (surface water or groundwater) of water sampled, suggests that some methodological problem may have been present.

The conditions at the site pose other health concerns not necessarily related to toxic chemical exposures. Standing water accumulating in the drums and tires which are on-site can provide breeding grounds for insects that harbor diseases. Buried drums, if present, may continue to leak their contents and further affect the environment.

Physical hazards are also present on-site. Deteriorating drums could cause serious wounds due to sharp edges. Tetanus and other infections are always a concern when such wounds occur. The tires could also present a hazard if they are set on fire. Smoke from burning tires contains toxic fumes that could be hazardous, particularly to individuals that have respiratory illnesses. Individuals may be affected by the irritating effects of the smoke. Also, during fires, tires which have remained inflated may explode. An explosion could project the rim and pieces of rubber at high rates of speed, creating a situation where direct injuries and death could occur.

CONCLUSIONS

Based on the information presented, ATSDR concludes that the site represents a potential public health threat.

RECOMMENDATIONS

1. Restrict access to the site.

2. Determine the presence of buried drums or other wastes.

3. Resample water of off-site private well that was previously sampled. If water quality is not potable, provide alternate potable water supply for consumption.

4. Determine the use of the private wells in the area and monitor water quality. If necessary, provide alternate potable water supply for consumption to all households found to have nonpotable water in wells, if well water is used for consumption.

5. Determine if off-site migration of contaminants has occurred or is occurring.

If additional information becomes available, or you desire further clarification, please do not hesitate to contact us.

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